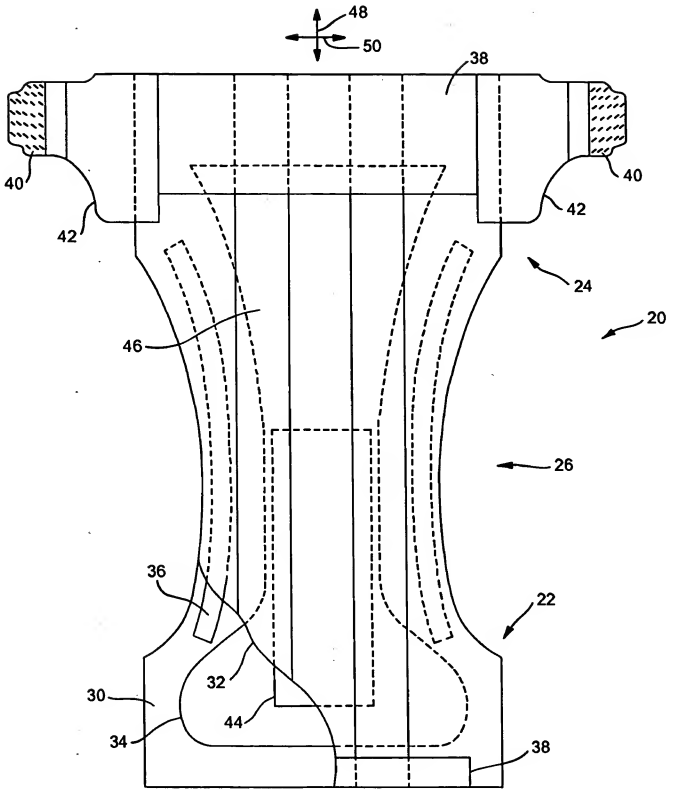

FIG. 1

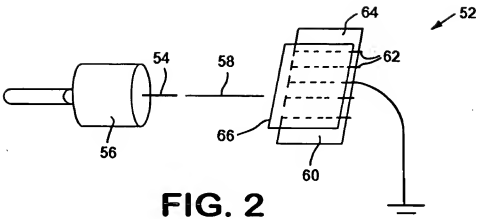

FIG. 2

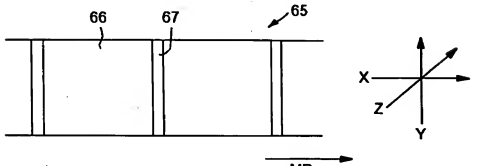

FIG. 3

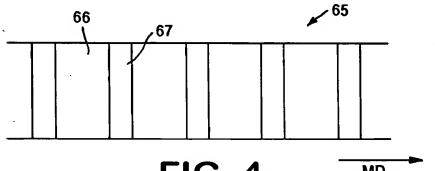

FIG. 4

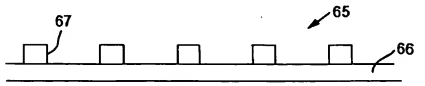

FIG. 5

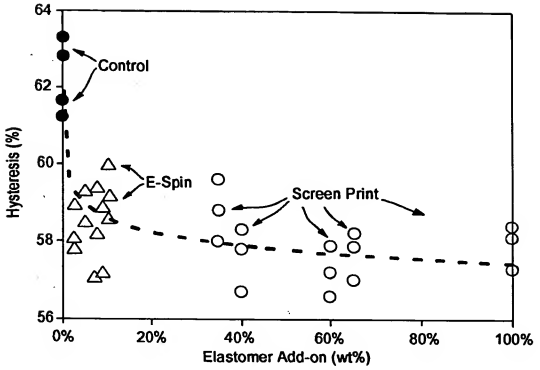
64
62
60
58
56
Hysteresis (%)
Control
E-Spin
Screen Print
0%
20%
40%
60%
80%
100%
Elastomer Add-on (wt%)

FIG. 6

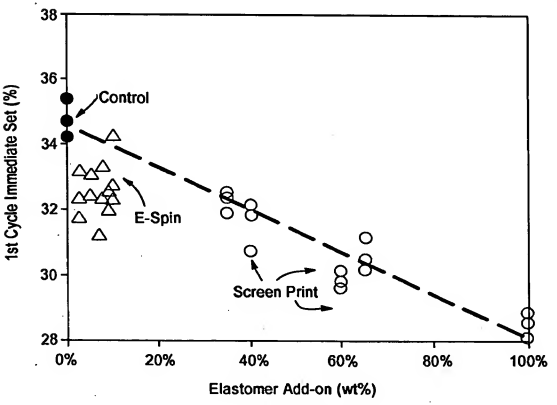
38
36
34
32
30
28
1st Cycle Immediate Set (%)
Control
E-Spin
Screen Print
0%
20%
40%
60%
80%
100%
Elastomer Add-on (wt%)

FIG. 7

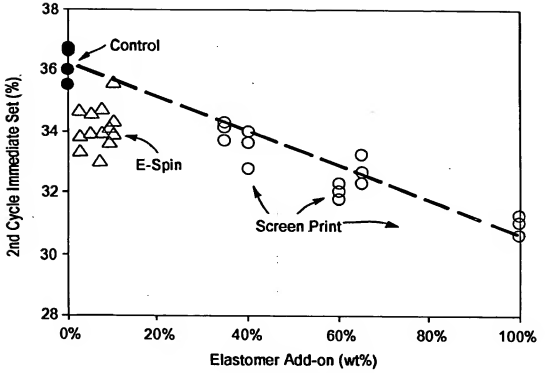
38
36
34
32
30
28
2nd Cycle Immediate Set (%)
Control
E-Spin
Screen Print
0%
20%
40%
60%
80%
100%
Elastomer Add-on (wt%)

FIG. 8

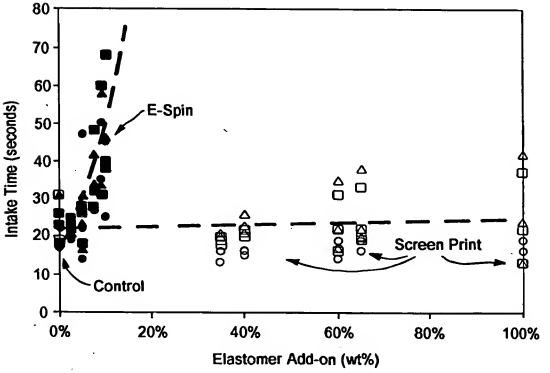
80
70
60
50
40
30
20
10
0
Intake Time (seconds)
E-Spin
Screen Print
Control
0%
20%
40%
60%
80%
100%
Elastomer Add-on (wt%)

FIG. 9

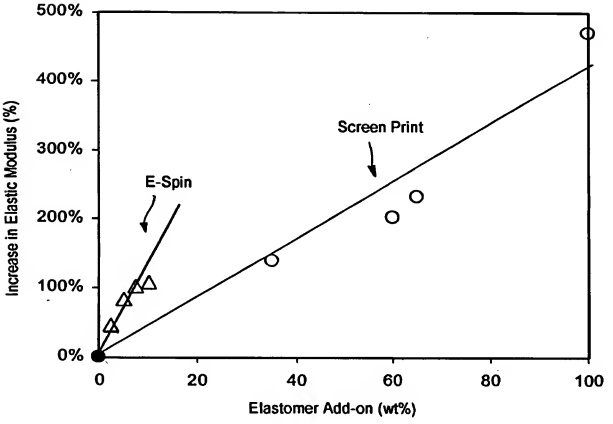
500%
400%
300%
200%
100%
0%
Increase in Elastic Modulus (%)
Screen Print
E-Spin
0
20
40
60
80
100
Elastomer Add-on (wt%)

FIG. 10

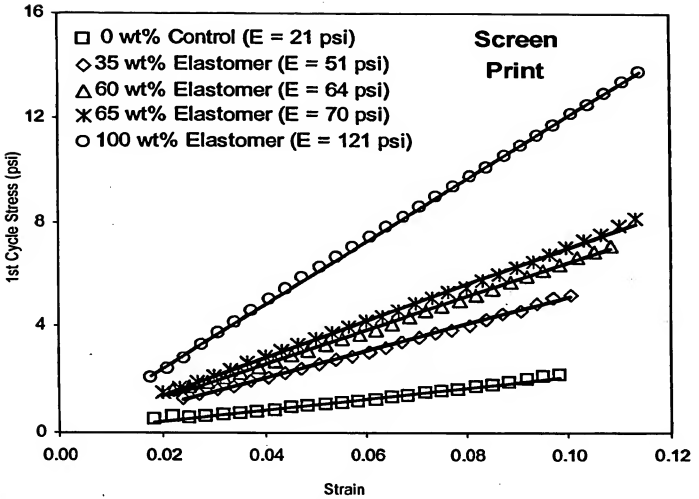
16
12
8
4
0
0.00
0.02
0.04
0.06
0.08
0.10
0.12
1st Cycle Stress (psi)
Strain
0 wt% Control (E = 21 psi)
35 wt% Elastomer (E = 51 psi)
60 wt% Elastomer (E = 64 psi)
65 wt% Elastomer (E = 70 psi)
100 wt% Elastomer (E = 121 psi)
Screen
Print

FIG. 11

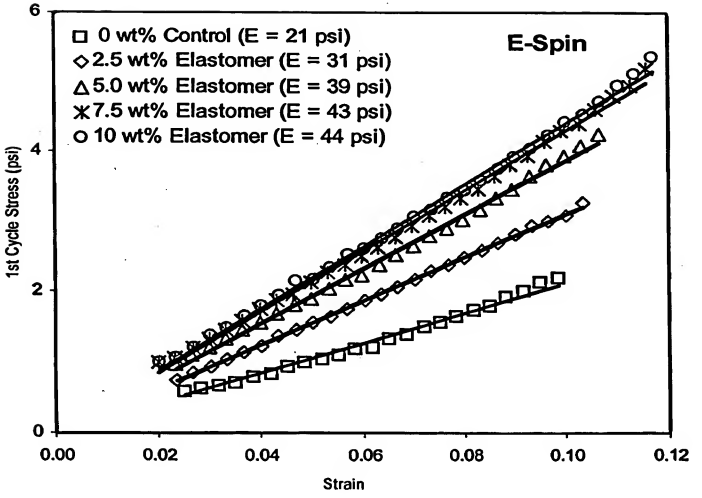
E-Spin
0 wt% Control (E = 21 psi)
2.5 wt% Elastomer (E = 31 psi)
5.0 wt% Elastomer (E = 39 psi)
7.5 wt% Elastomer (E = 43 psi)
10 wt% Elastomer (E = 44 psi)
1st Cycle Stress (psi)
Strain
0
2
4
6
0.00
0.02
0.04
0.06
0.08
0.10
0.12

FIG. 12

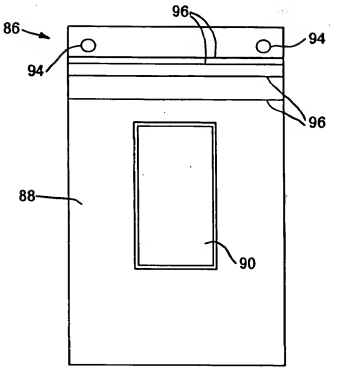

FIG. 13

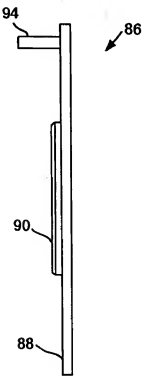

FIG. 14

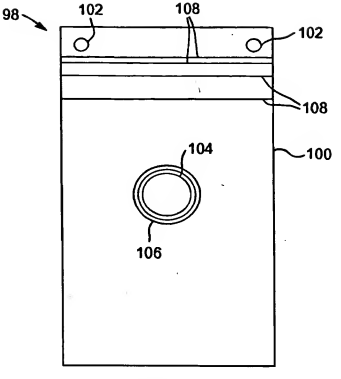

FIG. 15

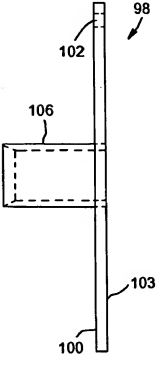

FIG. 16

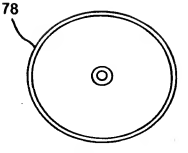

FIG. 17

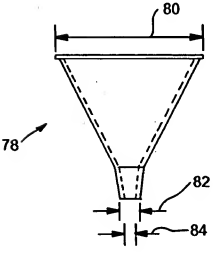

FIG. 18

	Spcm. No.	Kraton add-on wt%	Load @ 30 Up Cyc 1 gf	Load @ 50 Up Cyc 1 gf	Load @ 30 Dn Cyc 1 gf	Load @ 50 Dn Cyc 1 gf	TEA (Ext) Cyc 1 kg-mm	TEA (Ret) Cyc 1 kg-mm	% Hyster Loss Cyc 1 %	Load @ 30 Up Cyc 2 gf	Load @ 50 Up Cyc 2 gf	Load @ 30 Dn Cyc 2 gf	Load @ 50 Dn Cyc 2 gf	TEA (Ext) Cyc 2 kg-mm	TEA (Ret) Cyc 2 kg-mm	% Hyster Loss Cyc 2 %	Immed Set % Cyc 1 %	Immed Set % Cyc 2 %	Load Loss at 50% gf
Control	1	0.0%	335	831	−18	678	0.194	0.033	82.8	33	767	−22	655	0.088	0.032	63.3	35.387	36.7	210.974
	2	0.0%	473	964	−15	787	0.254	0.042	83.6	58	888	−21	759	0.11	0.042	61.6	34.199	35.538	212.451
	3	0.0%	409	934	−17	763	0.227	0.041	81.8	42	862	−22	738	0.103	0.04	61.2	34.692	36.025	210.054
	4	0.0%	373	861	−18	697	0.208	0.035	83.2	34	789	−23	673	0.091	0.034	62.8	35.341	36.599	218.703
1SP	1	35.0%	480	933	−3	760	0.26	0.049	81.1	73	848	−10	726	0.112	0.045	59.6	32.512	34.27	222.332
	2	35.0%	539	1049	−3	851	0.292	0.055	81.2	78	950	−10	809	0.125	0.051	58.8	32.37	34.144	228.89
	3	35.0%	601	1154	0	939	0.323	0.06	81.3	88	1051	−9	899	0.14	0.059	58	31.867	33.689	220.98
2SP	1	65.0%	516	1008	3	832	0.279	0.059	78.9	95	916	−7	787	0.128	0.054	58.2	31.151	33.206	219.291
	2	65.0%	618	1068	6	889	0.323	0.063	80.5	116	980	−5	842	0.142	0.06	57.9	30.488	32.668	211.628
	3	65.0%	670	1198	9	987	0.353	0.072	79.6	123	1092	−4	941	0.158	0.068	57	30.132	32.298	214.511
3SP	1	40.0%	629	1138	5	941	0.332	0.069	79.3	107	1041	−6	899	0.147	0.064	56.7	30.714	32.775	210.6
	2	40.0%	550	1069	−2	878	0.293	0.057	80.5	77	977	−10	833	0.13	0.055	57.8	32.119	33.98	220.908
	3	40.0%	520	953	0	790	0.272	0.052	80.9	83	873	−9	750	0.119	0.05	58.3	31.793	33.639	212.73
4SP	1	100.0%	687	1142	19	930	0.366	0.069	81.2	148	1016	4	875	0.155	0.064	58.4	28.52	31.069	233.821
	2	100.0%	708	1192	18	983	0.373	0.072	80.8	150	1071	2	922	0.164	0.07	57.3	28.817	31.26	226.97
	3	100.0%	731	1184	23	976	0.385	0.073	80.9	168	1062	6	906	0.168	0.07	58.1	28.065	30.633	234.636
5SP	1	60.0%	619	1133	9	926	0.329	0.065	80.4	115	1031	−2	890	0.146	0.063	57.2	30.133	32.303	215.08
	2	60.0%	676	1154	11	950	0.352	0.068	80.7	130	1052	−2	897	0.154	0.065	57.9	29.761	32.053	222.192
	3	60.0%	758	1339	13	1094	0.398	0.078	80.4	140	1219	−1	1052	0.177	0.077	56.6	29.602	31.805	213.999

Table 1

	Specm. No.	Kraton add-on wt%	Load @ 30 Up Cyc 1 gf	Load @ 50 Up Cyc 1 gf	Load @ 30 Dn Cyc 1 gf	Load @ 50 Dn Cyc 1 gf	TEA (Ext) Cyc 1 kg/mm	TEA (Ret) Cyc 1 kg/mm	% Hyster Loss Cyc 1 %	Load @ 30 Up Cyc 2 gf	Load @ 50 Up Cyc 2 gf	Load @ 30 Dn Cyc 2 gf	Load @ 50 Dn Cyc 2 gf	TEA (Ext) Cyc 2 kg/mm	TEA (Ret) Cyc 2 kg/mm	% Hyster Loss Cyc 2 %	Immed Set % Cyc 1 %	Immed Set % Cyc 2 %	Load Loss at 50% gf
6ES	1	10.0%	262	854	−7	694	0.183	0.039	78.5	40	782	−11	667	0.09	0.037	59.2	34.324	35.629	218.854
	2	10.0%	581	1077	−8	883	0.301	0.052	82.6	88	992	−16	844	0.132	0.053	60	32.762	34.328	216.312
	3	10.0%	614	1161	−6	956	0.319	0.06	81.3	90	1068	−13	919	0.143	0.059	58.6	32.315	33.914	207.838
7ES	1	5.0%	162	664	−10	536	0.129	0.027	79.2	25	611	−14	514	0.066	0.025	62	35.958	37.13	226.497
	2	5.0%	396	861	−6	707	0.22	0.044	80.1	59	797	−10	680	0.102	0.042	59.3	33.075	34.616	211.206
	3	5.0%	498	934	−3	767	0.262	0.05	80.8	76	859	−9	738	0.116	0.048	58.5	32.447	33.969	210.292
8ES	1	2.5%	611	1107	−4	920	0.317	0.059	81.4	88	1025	−12	879	0.138	0.058	57.8	32.348	33.898	205.988
	2	2.5%	549	1057	0	867	0.29	0.056	80.6	86	971	−6	827	0.132	0.055	58.1	31.77	33.37	217.485
	3	2.5%	447	960	−6	787	0.248	0.05	79.7	61	886	−12	761	0.112	0.046	58.9	33.194	34.722	207.293
9ES	1	7.5%	531	1037	−3	846	0.285	0.055	80.7	76	956	−8	814	0.126	0.053	58.2	32.363	33.964	214.699
	2	7.5%	601	1113	2	919	0.311	0.062	80	101	1027	−6	885	0.144	0.062	57.1	31.253	33.019	204.361
	3	7.5%	444	903	−7	742	0.239	0.043	82	61	836	−12	712	0.107	0.043	59.4	33.349	34.768	211.468
10ES	1	9.0%	512	954	−1	777	0.27	0.051	80.9	83	873	−8	744	0.118	0.049	58.9	31.996	33.648	219.88
	2	9.0%	493	1084	−4	890	0.278	0.059	78.9	70	1004	−9	852	0.131	0.056	57.2	32.586	34.158	214.45
	3	9.0%	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

Table 2

Mechanical Properties of Screen Printed Materials

	Elastomer Add-on wt%	% Hyster Loss Cyc 1 %	% Reduction vs Control %	Immed Set % Cyc 1 %	% Reduction vs Control %	Immed Set % Cyc 2 %	% Reduction vs Control %	Modulus of Elasticity psi	Improve vs Control %
Control	0%	83%	N/A	35%	N/A	36%	N/A	21	N/A
Sample 1sp	35%	81%	2%	32%	10%	34%	6%	51	140%
Sample 3sp	40%	80%	3%	32%	11%	33%	7%	-	-
Sample 5sp	60%	81%	3%	30%	16%	32%	11%	64	200%
Sample 2sp	65%	80%	4%	31%	14%	33%	9%	70	230%
Sample 4sp	100%	81%	2%	28%	20%	31%	14%	121	470%

Table 3

Mechanical Properties of E-Spin Materials

	Elastomer Add-on wt%	% Hyster Loss Cyc 1 %	% Reduction vs Control %	Immed Set % Cyc 1 %	% Reduction vs Control %	Immed Set % Cyc 2 %	% Reduction vs Control %	Modulus of Elasticity psi	% Improve vs Control %
Control	0%	83%	N/A	35%	N/A	36%	N/A	21	N/A
Sample 6es	2.5%	81%	3%	32%	8%	34%	6%	31	40%
Sample 7es	5%	80%	3%	34%	4%	35%	2%	39	80%
Sample 9es	7.5%	81%	2%	32%	9%	34%	6%	43	100%
Sample 10es	9%	80%	4%	32%	10%	34%	6%	-	-
Sample 6es	10%	81%	2%	33%	6%	35%	4%	44	100%

Table 4